

## CLAIMS

What is claimed is:

1 1. A direct conversion receiver (DCR) comprising:  
2 a pair of quadrature conversion paths, each of said quadrature conversion  
3 paths receiving an RF input signal and converting said RF input signal to a digital  
4 baseband signal, said each quadrature conversion path comprising:  
5 a mixer mixing said RF input signal with a carrier phase signal,  
6 an analog filter receiving a quadrature baseband signal from said multiplier  
7 and providing a filtered baseband signal,  
8 an analog-to-digital converter (ADC) converting a quadrature baseband  
9 component to a digital baseband signal,  
10 a 5<sup>th</sup> order elliptical filter filtering said quadrature baseband component, and  
11 a phase equalizer compensating for phase distortion arising in said analog  
12 filter; and  
13 a baseband processor receiving quadrature digital baseband outputs from said  
14 pair of quadrature conversion paths and providing digital information therefrom.

1 2. A DCR as in claim 1 wherein each phase equalizer is a second order all pass  
2 digital phase equalizer.

1 3. A DCR as in claim 2 wherein the phase equalizer has a transfer function  
2 defined by

3 
$$H_{eq}(z) = \frac{b_0 + b_1 z^{-1} + b_2 z^{-2}}{a_0 + a_1 z^{-1} + a_2 z^{-2}}$$

4 where  $a_0=b_2$ ,  $a_1=b_1$ ,  $a_2=b_0$ .

1 4. A DCR as in claim 3 wherein each 5<sup>th</sup> order elliptical filter receives the  
2 digital output of the ADC and provides said digital baseband component to the phase  
3 equalizer.

1 5. A DCR as in claim 3 wherein each 5<sup>th</sup> order elliptical filter receives the  
2 filtered baseband signal from the analog filter and provides the quadrature baseband  
3 component to the ADC, the ADC output being provided to the phase equalizer.

1 6. A direct conversion receiver (DCR) comprising:  
2 a pair of quadrature conversion paths, each of said quadrature conversion  
3 paths receiving an RF input signal and converting said RF input signal to a digital  
4 baseband signal, said each quadrature conversion path comprising:  
5 a mixer mixing said RF input signal with a carrier phase signal,  
6 an analog filter receiving a quadrature baseband signal from said multiplier  
7 and providing a filtered baseband signal,  
8 an analog-to-digital converter (ADC) converting a quadrature baseband  
9 component to a digital baseband signal,  
10 a 5<sup>th</sup> order elliptical digital filter receiving said quadrature baseband  
11 component and providing a filtered digital baseband component, and  
12 a phase equalizer compensating said filtered digital baseband component for  
13 phase distortion arising in said analog filter; and  
14 a baseband processor receiving quadrature digital baseband outputs from said  
15 pair of quadrature conversion paths and providing digital information therefrom.

1 7. A DCR as in claim 6 wherein each phase equalizer is a second order all pass  
2 digital phase equalizer.

1 8. A DCR as in claim 7 wherein the phase equalizer has a transfer function  
2 defined by

$$H_{eq}(z) = \frac{b_0 + b_1 z^{-1} + b_2 z^{-2}}{a_0 + a_1 z^{-1} + a_2 z^{-2}}$$

4 where  $a_0=b_2$ ,  $a_1=b_1$ ,  $a_2=b_0$ .

1 9. A direct conversion receiver (DCR) comprising:  
 2 a pair of quadrature conversion paths, each of said quadrature conversion  
 3 paths receiving an RF input signal and converting said RF input signal to a digital  
 4 baseband signal, said each quadrature conversion path comprising:  
 5 a mixer mixing said RF input signal with a carrier phase signal,  
 6 an analog filter receiving a quadrature baseband signal from said multiplier  
 7 and providing a filtered baseband signal,  
 8 a 5<sup>th</sup> order elliptical filter filtering said filtered baseband signal and providing  
 9 a quadrature baseband component,  
 10 an analog-to-digital converter (ADC) converting said quadrature baseband  
 11 component to a digital baseband signal, and  
 12 a phase equalizer compensating said digital baseband signal for phase  
 13 distortion arising in said analog filter; and  
 14 a baseband processor receiving quadrature digital baseband outputs from said  
 15 pair of quadrature conversion paths and providing digital information therefrom.

1 10. A DCR as in claim 9 wherein each phase equalizer is a second order all pass  
 2 digital phase equalizer.

1 11. A DCR as in claim 10 wherein the phase equalizer has a transfer function  
 2 defined by

$$3 \quad H_{eq}(z) = \frac{b_0 + b_1 z^{-1} + b_2 z^{-2}}{a_0 + a_1 z^{-1} + a_2 z^{-2}}$$

4 where  $a_0=b_2$ ,  $a_1=b_1$ ,  $a_2=b_0$ .